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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,886	12/30/2004	Jurgen Bohm	PC10467US	2731
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/519,886	<b>Applicant(s)</b> BOHM, JURGEN	
	<b>Examiner</b> Lin B. Olsen	<b>Art Unit</b> 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-19, 23 and 24 is/are rejected.
- 7) ☒ Claim(s) 20-22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/30/2004</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to because there is no translation of the words in the figures. In addition to the block labels, translation of the reference name such as  $\delta_{\text{soll}} = \delta_{\text{nominal}}$  is required. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

The disclosure is objected to because of the following informalities: On page 9, lines 15, 21 and 23, term  $\delta_L$  21 is identified as both “a sum steering angle” and “resulting steering angle.” – There should only be one definition for each term.

Appropriate correction is required.

### ***Claim Objections***

Claims 15, 17 and 18, are objected to because they include reference characters which are not enclosed within parentheses.

Reference characters corresponding to elements recited in the detailed description of the drawings and used in conjunction with the recitation of the same element or group of elements in the claims should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. See MPEP § 608.01(m).

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 23 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. There does not appear to be sufficient structural and functional interrelationships between the computer program and other claimed elements of a computer or processor which permit the computer program's functionality to be realized. For the claim to be statutory there is a

requirement that there be a functional interrelationship among the data and the computing processes performed when utilizing the data. A process consisting solely of mathematical operation does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **13-14 and 23-24** - are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,516,916 to Segawa et al. (Segawa). Segawa is concerned with a steering system that is based on the difference between the angle of the steering wheel and the angle of the steered wheel.

Regarding independent **claims 13 and 23 and claim 24**, "Method of steering a vehicle with a superimposed steering system, wherein

a steering angle input by the driver and an additional angle (additional steering angle) is determined and wherein the additional steering angle can override the input steering angle according to further quantities, by means of an electric motor," - In col. 5 line 56 through col. 6 line 5, Segawa describes determining the target control amount to an electromotive actuator by using the difference between the steering angle and the steered angle. The electromotive actuator output is then used to modify the control of the steered angle.

“wherein the method includes a steering angle control with a subordinated current or torque control of the electric motor.” As illustrated by Figures 3 and 4, the current to the electric motor is subordinate to the vehicle speed.

As to **claim 14**, “wherein an actual steering angle value and a nominal steering angle value is determined and, according to a comparison between the actual steering angle value and the nominal steering angle value, a nominal current or a nominal motor torque is produced by which the electric motor introduces the additional steering angle into the steering system.” - Segawa’s Fig. 5 presents a flow chart where the values read in are: vehicle speed, steering angle from steering wheel, and rotated angle of wheel shaft and the output  $i^*$  is the target driving current for the motor which will cause the additional driving angle. This aspect of Fig. 5 is described in col. 5 lines 43-57.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim **15 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Segawa as described in claim 13.

As to **claim 15**, “wherein a steering request of the driver  $\delta_{DRV}$  52 is determined on the basis of a steering wheel angle  $\delta_H$  50 adjusted by the driver, and wherein the driver's steering request  $\delta_{DRV}$  52 is composed of the adjusted steering wheel angle  $\delta_H$  50 and an invariably or variable predeterminable gear ratio factor and the gear ratio factor is chosen corresponding to the current driving situation,” - Fig. 3 as described in col. 5 lines 19-39 of Segawa, illustrates that the drivers steering angle ( $\theta_o^*$ ) is determined on the basis of the steering wheel angle  $\theta_i$  and a gear ratio factor  $K$ , where in Segawa,  $K$  is a function of the current driving condition, velocity.

“and wherein a nominal steering angle value 53  $\delta_{nominal}$  is determined on the basis of the so calculated steering request of the driver and sent to the steering control.”  
- Segawa does not disclose a separate determination of the nominal steering angle after determination of the driver's steering angle using a factor such as  $\Delta\delta$ , because the factors concerning the dynamics of the driving (velocity) are incorporated in the variable gear ratio. It would have been obvious to one having ordinary skill in the art at the time of the invention to separate the dynamic factors incorporated into the gear ratio into separate components, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

Regarding **claim 16**, which is dependent on claim 13, “wherein the driver's steering angle  $\delta_H$  is determined and, in connection with a gear ratio factor  $i_{L1}$  by which the driver's steering angle acts directly on the steering gear, an additional steering angle  $\delta_M$  is additively superimposed thereon in connection with a second gear ratio  $i_{L2}$ , and wherein a superimposed steering angle  $\delta_L$  is determined and sent as an actual value  $\delta_{L,actual}$  to the steering control, with said superimposed steering angle  $\delta_L$  being determined according to the following formula:  $\delta_L = i_{L1} \cdot \delta_H + i_{L2} \cdot \delta_M$ .” – Sagawa uses similar terminology but defines the current delivered to the motor to create the incremental angle ( $\delta_M$  in the claim,  $\theta_o^*$  in Sagawa) rather than the angle itself. Where  $\theta_o^* = (G \cdot ((KV \cdot \theta_i) - \theta_o))$ . It would have been obvious to one of ordinary skill in the art at the time of the invention to transform these equations into equivalents.

Claim **17 and 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sagawa as applied to claim 13 above, and further in view of U.S. Patent No. 6,225,579 to Hackl et al. (Hackl). Hackl is concerned with operating a steering system in a vehicle.

Regarding **claims 17 and 18**, which are dependent on claim 13, “wherein a driving dynamics control (ESP system) cooperates with the steering control, and wherein an additional steering angle  $\Delta\delta$  responsive to driving dynamics is determined when the necessity of a stabilizing intervention is detected by driving dynamics control.” – Sagawa shows superposed steering of the steering angle and an additional angle, but does not show an additional steering angle, from a driving

dynamics system. Hackl shows in Fig. 6 the addition of multiple additional angles for compensating for dynamic conditions such as yaw rate, yaw moment and crosswind. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the responsive system of Sagawa as the basis for Hackl's compensations in order to apply the known technique to an apparatus ready for improvement to predictably control the steering of a vehicle.

"wherein the additional steering angle  $\Delta\delta$  56 responsive to driving dynamics that is produced on the basis of a correcting intervention of a driving dynamics controller 57 is additively superimposed on the driver's steering request  $\Delta_{DRV}$  52." – As shown in Fig. 7 of Hackl, the additional angles are additively superimposed on the existing driving angle request  $\delta_L$ .

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sagawa as applied to claim 13 above, and further in view of U.S. Patent No. 6,550,871 to Bohm et al (Bohm II). Bohm II is concerned with control of brakes in motor vehicles.

Regarding claim 19, which is dependent on claim 13, "wherein the electric motor is additionally actuated by means of a field weakening current according to further quantities, with a view to increasing the motor speed without reduction of the available motor torque." – Sagawa actuates the motor based on steering, but does not use a field weakening current for any purpose. Bohm II teaches applying a field weakening current to the electromagnetic field of an electric motor in order to secure a higher speed from the motor while obtaining the same torque, as described in col. 5 lines 3-12. It would

have been obvious to one of ordinary skill in the art at the time of the invention who wanted to increase the motor speed without reducing the available torque to apply Bohm II's technique for the steering controller of Sagawa to improve an automotive device in the same way.

### ***Claim Objections***

#### ***Allowable Subject Matter***

Claims 20-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The cited prior art does not show or suggest use of a field weakening current to an electric motor that is additively superimposing an angle to a steering system when a very direct steering ration and/or a high nominal speed is desired or required. Further, the cited prior art does not show or suggest determining the ratio between the steered wheels and the driver's steering angle according to the formula recited and determining the motor speed specification based on the second formula cited.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 5,205,371 to Karnopp; U.S. Patent No. 5,853,064 to Hackl et al.; U.S. Patent No. 6,184,637 to Yamawaki et al.; U.S. Patent No.

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6,226,581 to Reimann et al.; U.S. Patent No. 7,168,520 to Weeber et al.; and U.S. Patent Pub. No. 2004/0084241 to Niessen et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIN B. OLSEN whose telephone number is (571)272-9754. The examiner can normally be reached on Mon - Fri, 8:30 -5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. B. O./  
Examiner, Art Unit 3661

/Thomas G. Black/  
Supervisory Patent Examiner, Art Unit 3661